

REMARKS

Favorable reconsideration and allowance of this application are requested.

1. Response to 35 USC §103(a) Rejections

Claims 1-6 attracted a variety of rejections under 35 USC §103(a). Specifically, claims 1-6 attracted a rejection under 35 USC §103(a) as allegedly unpatentable from Nelb, II et al (USP 4,672,094) in view of Koluch et al (USP 4,409,167) (see paragraphs 1-4 of the Official Action). These same claims have been rejected under this same statutory provision based on the same, but reversed, references, i.e., Koluch et al in view of Nelb, II et al (paragraphs 5-7 of the Official Action). Finally, claims 1-6 have been rejected under 35 USC §103(a) as allegedly unpatentable in view of Perego et al (USP 6,388,025) in view of Nelb II et al (paragraphs 8-11 of the Official Action).

As will become evident from the discussion which follows, the combinations of references relied upon in the Official Action dated September 12, 2007 to reject pending claims 1-6 herein are inappropriate. Accordingly withdrawal of all rejections advanced under 35 USC §103(a) is in order.

(i). Rejection based on Nelb, II et al in view of Koluch et al

Nelb, II et al mentions reaction of carboxyl functional polymers with diisocyanates or blocked diisocyanates, but preferably the diisocyanates are used in the unblocked state.

Kolouch et al on the other hand mentions reactions of diisocyanates with polymers having carboxyl and hydroxyl functional groups. (Column 3, lines 3 +). Kolouch et al states that MDI is preferred (Column 3, 29-30) and that the amounts of diisocyanates other than MDI depend on the reactivity with hydroxyl and carboxyl groups (Column 3, lines 48-50). Kolouch et al also states that "... diisocyanates that are

less reactive, are used in proportionally higher amounts" (Column 3, lines 52-54); and further that "larger amounts may cause undesirable excessive crosslinking." (Column 3, lines 44-45).

Koluch et al is silent about **blocked** diisocyanates. Thus implementing the teaching of Koluch et al in Kolb, II et al will not lead to a modification which would result in the presently claimed invention. Moreover, blocked diisocyanates are generally known in the art to be less reactive than diisocyanates. Taking such well known reactivity of blocked diisocyanates (of which the Examiner may take Official Notice) in combination with the comments in Kolb, II et al that preferably the diisocyanates are used in the **unblocked** state and the comments in Koluch et al about diisocyanates with lower reactivity and excessive crosslinking, it is most certainly **not** obvious to modify the carboxyl groups into hydroxyl groups and meanwhile also modify the disclosed diisocyanates into blocked diisocyanates.

Hence there is no apparent reason to combine Kolb, II et al and Koluch et al in the first instance and even if combined the present invention would not be the result. Withdrawal of the rejection advanced under 35 USC §103(a) based on Kolb, II et al in view of Koluch et al is therefore in order.

(ii). Rejection based on Koluch et al in view of Nelb, II et al

The reasoning above is equally germane to the rejection under 35 USC §103(a) based on Koluch et al as the primary reference and Nelb, II et al as the secondary reference.

Furthermore, the results of the present invention that hardly any branching if any occurs, let alone excessive crosslinking, and that chain extension resulting in a colorless, stable linear polymer with increased molecular weight is obtained in a very short time, is highly unexpected.

As the examiner states himself (Official Action at paragraph 6), "...blocked isocyanates are [known in the art] to improve the shelf-life of a two component [system]" but that blocking agents are not preferred since they also "degrade the resulting polymer during deblocking". Thus, the relatively short reaction times obtained with the blocked diisocyanates in the process according the invention and absence of side reactions resulting in crosslinking and degradation of the polymer contravene the art knowledge which the Examiner acknowledges and, moreover, cannot possibly be predicted from the results reported in either Koluch et al and/or Nelb, II et al (regardless of which order they are considered) for unblocked diisocyanates.

Therefore claims 1-6 cannot be considered "obvious" under 35 USC §103(a) based on the combination of Koluch et al in view of Nelb, II et al (and vice versa).

(iii). Rejection based on Perego et al in view of Nelb, II et al

The applied Perego et al reference describes a method of increasing the molecular weight of low molecular weight polyester polyol and/or polycarboxylic acid by reacting such polyol with diisocyanate. The reaction is performed in the solid state (Perego et al, claim 1), i.e. at room temperature or at a temperature lower than the melting point of the polyester resin (Perego et al, claim 1 and Column 5, lines 44-46). Perego et al also states that "...the reaction is performed in the solid state at low temperature." (Column 1, line 44). Therefore, Perego et al most certainly do **not** disclose a reaction that is carried out in the melt as erroneously alledged by the Examiner in lines 2-4 of paragraph 8 in the Official Action.

Applicants readily admit that Perego et al discloses "the chain extender is used in its liquid state" (Column 1 line 44). However, Perego et al also mentions that "to reduce reaction times the chain extender (i.e. diisocyanate) is mixed in the melted polymer" (Column 1, lines 50-53), however, adding the cautionary restriction of "using relative

short contact times, generally less than five minutes, this in order to avoid undesirable cross-linking reactions" (Column 1, lines 53-55).

The reaction times are much longer than the contact times, with reaction times of for example 4 days (Example 1) and 2½ days (example 5). In Comparison Example 1 of Perego et al (Column 5, lines 5-15) the reaction was done in the melt, but had a reaction time of only 15 hours and resulted in a gelled polymer.

Thus, although Perego et al discloses reaction of hydroxyl functional polyesters with diisocyanates, there is no disclosure therein of short reaction times, even despite the use of unblocked diisocyanates. Perego et al further teaches reaction in the solid state, rather than in the melt, since the latter would result in undesirable cross-linking reactions and gel formation.

Perego et al is silent about blocked diisocyanates. Moreover, blocked diisocyanates are generally known to be less reactive than diisocyanates. Again, taking such knowledge into consideration in light of the comments in Perego et al about the use of low reaction temperature to avoid excessive crosslinking, and the comments in Nelb, II et al that preferably the diisocyanates are used in the unblocked state, the only conclusion to be reached is that it is **unobvious** to modify the carboxyl groups of Nelb, II et al into hydroxyl groups, to perform the reaction in the melt rather than in solid phase and meanwhile also modify diisocyanates into blocked diisocyanates.

Furthermore, the results of the present invention that hardly any branching if any occurs, let alone excessive crosslinking, and that chain extension resulting in a colorless, stable linear polymer with increased molecular weight is obtained in a very short time, is highly unexpected.

As the examiner states himself (Examiner's report points 9) "blocked isocyanates are employed to improve the shelf-life of a two component system", and also "degrade the resulting polymer during deblocking".

Thus, the relatively short reaction times obtained with the blocked diisocyanates in the process according the invention and absence of side reactions resulting in crosslinking and degradation of the polymer cannot be predicted from the results of Perego et al and Nelb, II et al reported for unblocked diisocyanates, but also contravenes the expectations of the skilled person.

Therefore claims 1-6 are likewise not obvious under 35 USC §103(a) based on Perego et al and Nelb, II et al. Withdrawal of such rejection is in order.

2. Fee Authorization

The Commissioner is hereby authorized to charge any deficiency, or credit any overpayment, in the fee(s) filed, or asserted to be filed, or which should have been filed herewith (or with any paper hereafter filed in this application by this firm) to our Account No. 14-1140.

Respectfully submitted,

NIXON & VANDERHYE P.C.

By: /Bryan H. Davidson/
Bryan H. Davidson
Reg. No. 30,251

BHD:dlb
901 North Glebe Road, 11th Floor
Arlington, VA 22203-1808
Telephone: (703) 816-4000
Facsimile: (703) 816-4100